

# LEPROSY.

(RE-PRINTED FROM THE INDIAN MEDICAL GAZETTE.)

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*(Reprinted from the "Indian Medical Gazette.")*

THE following remarks on leprosy have been suggested by a perusal of "A Medical Report upon the character and progress of Leprosy in the East Indies, being answers to interrogatories drawn up by the Royal College of Physicians, London." This volume has been recently published by the Indian Government, and contains no less than 107 reports from medical officers located between Peshawur and Calcutta, and the Himalayas and Central India, together with Burmah and the Straits.

I propose to analyze the contents of this work, and endeavour to solve the following questions regarding this terrible disease :—

I. What are the distinguishing characters of leprosy? Is it a specific disease, or does it depend on syphilis or any other affection?

II. Is leprosy common among the natives of the East Indies? Is it on the increase or not?

III. Is leprosy confined to any particular class of natives? Are any exempt from its influence?

IV. What circumstances favour its spread among the natives? Is it hereditary, is it contagious, is it transmitted by sexual intercourse?

V. Has any provision been made for the cure or treatment of leprosy patients in this country.

VI. Is the disease curable? or are there any known means in existence for curtailing the spread of leprosy?

There is evidently considerable confusion in the minds of some medical men as to what leprosy is. In many of the reports before us, leucoderma is described as a form of leprosy, and so is the Barbadoes leg. The idea regarding the former affection has arisen from the expression used in the Bible, "as white as a leper;" persons therefore affected with an absence of pigment occurring in spots over the surface of the body (leucoderma), are supposed by some to be suffering from leprosy. With regard to the Barbadoes leg, the notion that it was connected with leprosy has arisen from a strange jumbling up of names. In the Sydenham Society's translation of Paulus Aegineta, book fourth, Section IV., 1, he says:—"For if cancer, which is, as it were, an elephantiasis in a particular part, is ranked among the incurable diseases by Hippocrates himself, how much more is elephantiasis incurable, which, as it were, is a cancer of the whole body? Wherefore, those who are already overpowered by the disease must be abandoned; but, when the affection is in its commencement, so as that none of the extremities have fallen off, nor the surface of the body become ulcerated, nor the hard swellings appeared, and the face merely appears foul, but not altogether unseemly, we must attempt a cure." Now, this disease which Paulus Aegineta calls elephantiasis, is evidently the leprosy of the present day. Isidorus tells us they called it elephantiasis, because it was a mighty disease; sometimes leontium or morbus leoninus, from the supposed resemblance of the eyebrows to those of a lion.

Dr. Adams, in his commentary on the above-named work, says, the Greek translators of the Arabian physician Avicenna rendered the Arabic word *juzum* or *judam* by lepra, but unfortunately they called quite a different affection, the Barbadoes leg, "elephantia," from its resemblance to the leg of an

elephant ; and the Greeks, who had been accustomed to designate leprosy as elephantiasis, came to mix up the idea of elephantia with elephantiasis, and thus the Barbadoes leg gradually came to be considered as a species of leprosy : this is evidently the origin of the terrible confusion which has occurred upon this point. To make matters worse, of late years, lepra, a species of skin disease classed by Willan under the order Squamæ, has been described as leprosy, with which it has no more relation, however, than leprosy has with scabies.

The question, therefore, arises as to what leprosy is, and we may decide this point by referring to the report before us. We are compelled to discard 17 of these reports as practically useless, and of the remaining 90 medical officers, 64 affirm that the various forms of leprosy described by European and Native practitioners are simply varieties of one specific form of disease, which has no relation to syphilis or any other known affection. Thirty-nine of these officers further remark, that there are only two varieties of leprosy, the anæsthetic and tubercular ; they frequently run into one another ; in fact, in the same case, there is no positive or even apparent line of demarcation between them. From a careful perusal of this report, it appears not only that the supporters of this idea are numerically stronger than any other class, but they are the most careful set of observers, and their evidence is, on the whole, conclusive. It may therefore be affirmed that the anæsthetic and tubercular are the only two forms of leprosy. At one time the disease may assume more marked symptoms of the anæsthetic variety, at another time of the tubercular ; but whatever form it takes, it arises from the same abnormal condition of the system.

In by far the majority of these reports, leprosy is described as commencing with well marked premonitory symptoms. Dr. B. N. Bose, of Furruchpore, remarks (page 96) that—" Long ante-

cedent to the actual appearance of the eruption, or other obvious and unmistakeable signs of the disease, a variety of symptoms generally present themselves, which, although singly, that is, one by one, would be of little or no value in a pathological point of view, are of the highest importance when taken collectively, as being the precursors, or, as it were, the gathering elements of the formidable attack which is impending. Leprosy, indeed, seldom commences abruptly, and a certain initiatory or previous state in relation to the breaking out of its peculiar eruptions, may be observed in almost every case. The precursory symptoms are generally traceable to a kind of cachexy or dyscrasy, arising from a certain constitution peculiar to the disease, and which is either imbibed from parents by hereditary transmission, or acquired after birth from causes exterior to the individual."

Dr. Sutherland, of Patna, observes (page 188) that—"The characters of this taint are as follows:—A rough, harsh, and scurfy condition of the skin, chiefly of the hands and feet; it is rigid, wrinkled, dry, and harsh, and a hard-pointed substance drawn over it will leave a white line, like a pencil drawn over a slate; the heels are horny, cracked, and the soles of the feet are thickened and fissured, but in a less degree; the toe-nails are uneven, tubercular, much thickened, or almost wanting, their ends being thin, uneven, and ragged; persons affected to the above extent may remain in that state for years, the diseased condition not extending; but if subjected to privations, such as bad food, or food in insufficient quantity, defective clothing, impure air, laborious and exhausting occupation while the person is badly nourished, leprosy of the anæsthetic form will frequently be the result.

"I have invariably found that patients in hospital, in whom a leprous taint exists, recover more slowly from malarious fever or dysentery than persons who were previously healthy."



These premonitory symptoms having lasted for a longer or shorter period,—it may be for months, but more commonly for five or ten years,—the anæsthetic or tubercular varieties of the disease become manifest, though, as I have before stated, they are frequently so blended, the one with the other, that it is difficult to define which form predominates. If the anæsthetic, the patient suffers as described by Dr. Wise (page 116),—“It commences, I am told, generally by a burning sensation of the part; occasionally no uneasiness is felt. Portions of the skin are suddenly affected with loss of sensibility, and the dark colour of the skin is altered; the pigment appears to be gradually absorbed, in some entirely, in others only partially; the colour of the skin varies from a dusky olive to an almost pure white. These patches generally lose their hairs, are free from perspiration, and of a lower temperature than the surrounding surface; their shape is sometimes very irregular, at other times circular; in size they vary from the size of a rupee to that embracing the whole limb. I have never seen a case in which it extended over more than the half of a limb. When it attacks the hands or feet, it is generally confined to them. I have seen this form appear on the fingers, the toes, the navel, the eyebrows, the arms, and the sternum, while the rest of the body was quite healthy; its progress is very slow, and, as a rule, does not advance beyond this stage. It spares no rank,—the rich and the poor, the sailor and the banker, the well-fed and the half-starved, are all liable to its attacks. When the disease advances a stage further, the skin becomes hard and shrivelled, cracks appear, which degenerate into ulcers, and follow the same course as those in the tubercular form.”

If the tubercular form predominates, Dr. Durant observes (page 24),—“The most obvious and distinguishing character of this form, and that which gives to it its name and at once diagnoses it from any other disease, is to be found in the pecu-

liar hypertrophy of the skin which attends it; the enlargement sometimes occurs in the shape of small tumours, or tubercles, situated most usually on the alæ of the nose, lobes of the ears, skin of the forehead and cheeks, and the ends or joints of the fingers and toes; at other times the skin covering these parts is irregularly hypertrophied; it is always of an unhealthy appearance, and of a dusky colour, being generally darker than the unaffected portions. In more aggravated cases, the skin of the lips and eyelids is similarly affected, when the unfortunate victims present a most revolting and hideous aspect. The mind, to a certain extent, sympathises with the bodily affection, misery and a state of deep despondency being strongly portrayed in the features. In process of time, as the disease goes on increasing, the organic functions are also deranged, when, from failing nourishment and the already unhealthy condition of the blood, the tumours, or hypertrophied portions of the skin, begin to ulcerate and discharge an offensive and ichorous sanies, which state gradually leads on to the implication of the deeper structures, and the more ulterior consequences to be described under the head of the third and last form of the disease. In some cases, though, this last change does not take place for years; while, sometimes, the disease is so rapid in its destructive effects, as to almost appear as if it set in with mortification, producing ablation of the fingers and toes, without going through any of its preliminary stages."

Either of those forms or varieties of leprosy may lead to the last stage of the disease described by Dr. Durant as *lepra mutilans*. It would, however, be better to consider this as the last stage of leprosy. He remarks that,—“Nothing could be more revolting and pitiful to human nature, than the objects presented by this stage or form of it. No description could convey a full and accurate idea of its effects: to realise its horrors, the objects must be seen. The most obvious features of this



form are, the mutilations it causes of the fingers and toes, and, in some cases of the whole of the hands from the wrist-joints, and feet from the ankles, the latter being exactly what would be the case were Chopart's or Syme's operation performed on the individual. It is usually the result or sequence of the second or tubercular form, as has been already stated under that head. After the ulceration has commenced in the tubercular enlargements of the fingers and toes, caries, with mortification of the bones and other structures, soon follow; the lower or outermost joints, being first attacked, are the first to drop off, the others following in due succession. I have never seen this mortification or ablative action of the disease, if I may so call it, attack the face and body; it seems to confine its action to the ends of the extremities, or those parts most removed from the centre of the circulation, and so may possibly depend, in some measure, on a failure of the blood supply, as takes place in senile gangrene, or from a diseased action set up in the arteries supplying these parts, which, elongating them up, cuts off the blood supply, the part dying from a loss of nutrition. The nervous supply is also no doubt much impaired, as would appear from the loss of all sensibility in the parts, no pain ever being complained of throughout the whole destructive process. The ulcerative action usually commences with vesication, *i. e.*, a large bleb filled with serum makes its appearance on the part, which on breaking discloses the ulceration below; this vesicatory action is very easily produced in these cases, for the heat of the sun, or any other ordinary heated body, is sufficient for the purpose.

“In another class of cases, or phase of this form of the disease, instead of the direct ablation of the fingers and toes, a wasting or atrophy of the extremities takes place, with a shortening or contraction of the flexors of the fingers and toes, causing them to be bent on the palms of the hands and soles of the feet

respectively, or otherwise distorted, while a slow destructive process goes on in and about the nails and the last joints, eventually causing some of them to drop off: there is no doubt an atrophy of the nervous system also, in these cases, for the patient usually walks with a tottering or paralytic gait, and loses all power in the upper extremities, and sensibility in the fingers and of the skin in general; his mind is likewise much impaired, a state bordering on fatuity soon appearing, while the other senses, becoming obtuse also, combine to render the unfortunate sufferer unfit both for society or work of any kind, and a burden and misery to himself, and, may be, to his family or friends, should he happen to have any."

The above is an accurate description of the symptoms and course which leprosy runs among the natives of India. Its progress is slow, for it seldom destroys life before the patient is fifty-five years of age, and it usually manifests itself about the adult period of life. Instances are related in which it has appeared in childhood, but by far the majority of the reports under notice affirm that leprosy seldom comes on before the patient has reached his twentieth year. The disease reaches its maximum usually ten years after it has become fully developed, and although it seldom kills the patient before he is fifty years of age, still the greater number of those suffering from it die of want, starvation, or diarrhœa long before they have gained this period of life.

From the above account it is evident that leprosy is a distinct and specific disease. The affection nearest allied to it is syphilis, but in by far the majority of these reports the medical officers express themselves distinctly and positively on this point. Syphilis, they say, may, especially if combined with mercury, aggravate leprosy; but that leprosy has any other connexion with syphilis is denied most distinctly, and I quite concur in this opinion. Leprosy was known in India and

described by the Hindoo and Arabian physicians for centuries before syphilis was ever heard of. How far a leprous taint may, under certain circumstances engender syphilis, I am not prepared to state, nor is it the object of this paper to discuss the point; but it may be declared very positively that leprosy is a specific disease, having no connexion with syphilis or any known affection.

The symptoms of leprosy have been clearly defined; they usually commence when the patient is about twenty years of age, with certain well marked premonitory symptoms; it runs a slow course (though this may be subject to variation); and it may perhaps be checked in its early stages; but if the taint of the disease has become developed in the system, it is never eradicated.

II. I may now proceed to enquire if leprosy is a disease of common occurrence among the natives of India. On looking over the volume before me, it appears that, with few exceptions, the various Medical Officers of this Presidency assert that leprosy is frequently met with among the natives of their respective districts; the only exceptions to this are in the following instances:—Dr. Pyster, of Sandoway, Burmah, remarks:—“I have sought for information from all the Burmese physicians in this district, and find that there is not a single individual who could give me any on the subject, apparently none being acquainted with the history of the disease.” He states that he never saw a case in Sandoway. Dr. Nisbet, of Akyab, observes—“Though leprosy is well known in the town of Akyab, it seems to be confined for the most part to natives of Bengal, who have emigrated thither.” And from other reports it is evident that leprosy is almost unknown among the Burmese. Dr. Thornton, of Cherra Poonjee, remarks “that no case of leprosy has come under his observation; and it appears

the disease is very rare among the Cossyals." Dr. A. J. Meyers, of Singbhoom, observes that "leprosy is not known among the aborigines of the district, but now and then it is seen among pilgrims and travellers." With these four exceptions, every other medical officer throughout the Bengal Presidency assures us that leprosy is of frequent occurrence among the natives.

The prevalence of the disease varies in different localities, but I may quote Dr. Sutherland's opinion on this subject, page 194— "That a leprous taint is very common among the rural populations of the district of Patna is proved by the following facts:— Within the last six months I have had to examine 2,348 men intended for the new police of the city and district of Patna; these men appear before me in a state of nudity, with the exception of a cloth about the loins; traces of leprosy are thus easily observed: the average age of the men examined was 23 years. I found a leprous taint or diathesis to exist in one out of every ten, and this proportion was rejected as unfit for service.

"When serving with the native army, I found repeatedly that men who had in early life the character which I regard as a proof of the existence of a leprous taint, and which I have already described, frequently had to be invalided in after years for leprosy, and subsequent observation and enquiry have led me to the conclusion that the opinion I have formed regarding what I have named a leprous taint was correct, and that this condition precedes the appearance of the disease in its aggravated form; and, I think, I am warranted in concluding, from the data given above, that this leprous taint exists in one out of every ten of the adult rural population of this district. In stating this, I am aware that my views will probably astonish persons who have not given the subject the attention I have.

"Another test of the prevalence of leprosy in this district was to ascertain the proportion of leprous persons in the Patna jail.



“ Present strength of prisoners 368 ; of this number

“ Males	{	Hindoos... ..	292
		Mussulmans ... ..	56
“ Females	{	Hindoos... ..	16
		Mussulmans ... ..	4
Total ... ..			<hr/> 368

“ Among the Hindoos there were 17 persons affected with leprosy, or 1 in every 16.

“ Among Mussulmans 2 were affected, or 1 in 28 ; only one woman was affected—a Mussulmani. It thus appears that the disease is less prevalent among the Mussulmans, who approach nearer to European races, as regards their dietary, than the Hindoos.

“ While writing this report, 32 watchmen, belonging to the city of Patna, were sent to me to be passed, if efficient, into the new police ; the average age of the men was 36. I found among the persons examined two cases of leprosy, advanced to the ulcerative stage, and one case of incipient leprosy ; the affected mixed freely with the other men. The proportion of leprous to healthy persons was thus found to be nearly the same, as I had before observed to exist among the young candidates for the police ; but in this last instance, the men being old, the disease was found fully developed in two out of three affected.”

This is certainly a startling assertion ; one person in every sixteen affected with the taint of leprosy, and yet it comes from the pen of a most careful observer, who commences his report by the following statement :—“ I have lately devoted considerable time and attention to the subject, and personally examined all the worst cases of leprosy to be found in the city of Patna ; and I may add that my description of the disease is taken from nature and not from books.” Every word of Dr. Sutherland’s report fully bears out this observation. I men-

tion this fact because it is almost conclusive testimony as to the fearful extent to which leprosy prevails in some parts of India; and my own experience is in complete accordance with Dr. Sutherland's. From general consideration, it would appear the disease is on the increase, although, from want of statistics, it might be difficult to prove this assertion; definite information, on the subject of leprosy, is very difficult to collect; the natives shun even the mention of the disease, and will invariably, if possible, mislead us as to the facts of the case; it is only by close observation and casual remarks, such as those elicited by Dr. Sutherland from numerous leprosy patients, that it is possible to arrive at even an approximate conclusion on the subject.

We are, however, undoubtedly in a position to answer the question now under consideration in the affirmative. Leprosy is very common among the natives throughout the whole of this Presidency and the Straits, though, from want of statistical data, it is impossible for us to determine absolutely if it is on the increase or not; from its tendency to spread by hereditary taint, we may assume that it must be on the increase; and many of the reports before me contain statements which confirm me in this idea.

III. Is leprosy more common among any particular races in this country, or are any classes exempt from the disease?

It has been shown that, in some few races, leprosy appears to be unknown; but these exceptions are rare, for not only does the disease exist throughout the length and breadth of this Presidency, but in the Straits and Borneo it is equally prevalent, and appears to be on the increase. Dr. Rose reports, page 492—"It makes its appearance insidiously, generally preceded by more or less pyrexia and uneasy sensation about the parts; a dark coppery spot appears, sensibly raised



above the skin, is shining, and spreads rapidly ; first, generally, on the face ; the ala nasi becomes much enlarged ; the lobes of the ears, also, and the nipples, all presenting the same livid appearance ; sometimes it attacks the fingers and toes ; these ulcerate, and, in nearly every case, drop off. It frequently becomes arrested at the metacarpus and metatarsus. Leprosy is very common in the three stations of Penang, Malacca, and Singapore." And so also Dr. McDougall, Bishop of Labuan, writes, page 493—" In Sarawak, I think, the Chinese are more affected than either Dyaks or Malays. I have seen at least 50 or 60 cases in males of these races, but the greater number have been Chinese."

With regard to class, Dr. Delpratt, of Hazareebaugh, remarks—" There can be no doubt that the disease is more frequent in the male than in the female sex, though it is impossible, from want of statistics, to say what is the proportion between the two sexes in this district. The Mussulman and Hindoo are, numerically, nearly equally affected by the disease ; all my remarks have reference to the coloured population only ; if there be any difference, I believe the former race have the greater number of cases. The disease is far from being confined to the lower orders—rich and poor are alike victims to it ; but it is most common amongst what may be called the middle classes of native society." This statement expresses the general opinion of the various contributors to the report before me. There are evidently a few favoured races which appear to be exempt from the disease, but, with these exceptions, all classes of natives—high and low, rich and poor—are subject to its inroads ; probably each class suffers in direct proportion to its numerical strength.

From Dr. J. Simpson's admirable article on leprosy in the LVith No. of the *Edinburgh Medical Journal*, we find that, in

the middle ages, even Royalty itself was no bar against the disease. He says :—

“These observations are certainly by no means sufficient, either decidedly to confirm or controvert the opinion, that Henry IV. was affected with leprosy ; but they serve at least to show that, at the time at which he lived, rank of the highest kind was not considered as any adequate barrier against an attack of the disease.

“In none of these alleged cases of leprosy in the royal family of England, is the proof of the actual existence of the disease at all indubitable and complete. The evidence is more certain and satisfactory in regard to the occurrence of the malady, in its genuine form, in other scions of the House of Anjou, than those who ascended the throne of England. I allude especially to the case of Baldwin IV., King of Jerusalem, a direct descendant, like the Royal Plantagenets of England, from Fulk, Count of Anjou and Tourraine. All historians seem to agree in stating Baldwin IV. to have laboured for some years under elephantiasis, and to have ultimately resigned his sceptre in consequence of disability from that disease.”

“He was,” says Fuller, when speaking of him in the year 1174, “inclined to the leprosie called elephantiasis.” By the year 1183, “the leprosie had arrested him prisoner and kept him at home.” “Long” (adds the same historian) “had the king’s spirit endured this infirmity, swallowing many a bitter pang with a smiling face, and going upright with patient shoulders under the weight of his disease. It made him put all his might to it, because, when he yielded to his sickness, he must leave off the managing of the State ; and he was loth to put off his royal robes before he went to bed—a crown being too good a companion for one to part with willingly. But at last he was made to stoop, and retired himself to a private life.”

The disease, as has been above observed, did not spare the

royal family of Scotland. At least two cases of leprosy are alleged to have occurred among the members of it. It may not be generally known that King Robert the Bruce died of leprosy.\*

However, to return to this report, it appears that persons of mixed blood (European and Native) are also afflicted with leprosy, but in these instances it is very doubtful if it is not induced through the native stock. A particularly interesting exemplification of this fact is reported by Dr. Wise, p. 118 :—

“I have never seen or heard of a case of leprosy in a pure European.

“At Chittagong there are about 850 Roman Catholics of Portuguese descent, who have become almost natives in their colour and habits. The natives distinguish them from pure Europeans by the opprobrious term ‘Feringhees’. Their ancestors were the old Portuguese colonists of India. These married with natives, and a race of half-casts was the offspring. I cannot discover whether any new emigration has taken place since Chittagong came under British rule, but from the effeminaey and smallness of stature of the present race, I should imagine that breeding in and in has caused them to degenerate. Now-a-days they never marry with natives, and only occasionally is fresh blood introduced from some Portuguese colony. Their habits approximate very much to those of the Hindoos and Mussulmans ; they live in the same badly ventilated thatched houses, surrounded by the same jungle, and in the same bazaars ; they, however, dress more in the European fashion, but their food is, with few exceptions, similar to that of the natives ; they eat beef, generally young and very lean ; very fat pork, improperly fed, is their favourite animal food ; they use a considerable quantity of country spirits of very inferior quality. Mr. J. E. Bruce, Salt Agent

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\* *Vide* Dr. J. Simpson's report on Leprosy.

at Chittagong, informs me that during his residence of 29 years there, he has only known two severe cases of leprosy, and one slight one among these people. Monsieur Fonimond, their priest, says that leprosy is a very rare disease among them. In addition to the 850 above-mentioned, there are about 50 Native Christians who have no Portuguese blood. Leprosy is quite as rare among them as among the Feringhees; their habits and mode of living are similar. Leprosy is therefore much more common among the pure native population than in either of the others."

The external influences had in this instance been withdrawn, no fresh leprous taint was introduced into the colony, and hence the individuals constituting it were kept free from the disease.

And so with regard to other classes, with one or two exceptions, no instances are recorded of leprosy having been met with among Europeans. Dr. Cheke, of Benares, remarks, "that it is seen most frequently among natives of this country, though I have seen cases among the Eurasians, and Europeans;" but, with a few exceptions, the report contains no instances of leprosy occurring among Europeans in this country, and it may therefore be assumed that the disease is not often met with among them. I have lately had an opportunity of seeing a case in the instance of a European, one of Dr. Francis' patients, in the Medical College Hospital. The man, however, was a Swede, and being a sailor, was probably affected with what is called "spedalsked" by the Norwegians, and which is identical with leprosy as seen in India at the present day, and in the middle ages, was well known throughout Europe.

IV. What circumstances appear to induce leprosy? Is the disease hereditary or contagious? Is it transmissible by sexual intercourse?



No less than sixty-nine of the medical officers writing in this report assert that leprosy is hereditary, nine are doubtful, and only eight deny that leprosy is hereditary. It will be distinctly understood that these reports have been written by medical officers living in the midst of a population, many of whom are affected with leprosy; the probability is that no one medical man was aware of the ideas entertained on this subject by his brother-medico in the next district; each officer, therefore, has had ample opportunities of studying the nature of the disease from leprosy patients, and his report is a perfectly independent one, being the unbiassed opinion of the writer. With evidence of this kind before us, eighty per cent. of the reporters asserting that leprosy is hereditary, is certainly a very strong proof of the fact. Dr. Garden, of Ghazee-pore, expresses his opinion as follows:—

“The disease is undoubtedly hereditary in many instances: in 155 cases of lepra tuberculosa, in 16 of lepra anæsthetica ———, it is stated by the patient to be such”.

“The general feeling, too, of the population is that it is hereditary, and on that account its existence is a bar to inter-marriages.

“On the other hand, nothing is commoner than to find one member alone of a family affected, as will be seen in the short notes of cases in the Appendix.”

Remarks to this effect are to be found in almost every report throughout this work, and the same idea is the universal belief of almost all the natives in this part of India. Ancient authors, as also those of the middle ages, never doubted the hereditary nature of the disease. Dr. Simpson observes in his article on the subject, in the XLVIth Volume of the *Edinburgh Medical Journal*, that “These and other similar data show that the predisposition to leprosy, like the predisposition to other hereditary diseases, may occasionally

show itself in one or two individual members of a family, and may sometimes lie dormant for one or two generations, to re-appear in a subsequent one." "In some of the few districts of Europe, in which cases of the disease have continued to linger down to a late period, the malady seems to be transmitted through an old hereditary taint in particular families, rather than generated by existing external circumstances acting on the bodies of those who now become its victims. The tubercular leprosy exists still, or at least existed lately, in the districts of Martignes and Vitrolles, in the south of France. The cases, though very few, have still been well marked. M. Vidal, who, towards the end of the last century, described several instances of the disease which he saw at Martignes, states that, with one problematical exception, the malady was in every case hereditary." "May we not," he adds, "conclude from this, that if the local causes which are generally assigned for leprosy be true, they have not, at least in our country, sufficient power to originate the disease (*la faire naître*), but generally only to develop and perpetuate it in the descendants of ancient lepers. The same family predisposition probably perpetuated the malady for some generations in the few cases that occurred in Shetland, in the latter part of the last century. The case of the Shetlander Berns, as mentioned in a preceding part, was an instance in which the disease was apparently the result of hereditary transmission from his ancestry."

The predisposition from hereditary constitution to leprosy, and some other diseases, was well known to our forefathers. For, to quote the words of Boeetius: "He that was troubled with the falling evil (epilepsy) or fallen deaf or wode (insane), or having such infirmities as succeed by heritage from the father to the son, was geldit (castrated), that his infected blood should spread no further. The woman that was fallen leper, or had



any other infection of blude, was banist fra the company of men, and gif she consavit barne under sic infirmitie, baith she and hir barne war buryit quik, (if she conceived a child under such infirmity, both she and her child were buried alive.”)

Dr. Hjort, a high authority on the subject, doubts the hereditary nature of leprosy as seen among the Norwegians ; but, on the other hand, Dr. Danielssen, writing from the same locality, observes (*Medico-Chirurgical Review* for April 1858):—

“When the spedalskhed has once found its way into a family it spreads itself on every side, and that in so fearful a mode, that no member of the family is secure from it. True it is that occasionally the disease appears to have died out in a family, since two generations in succession are occasionally seen to escape the disease, but this cessation is only apparent, and not real ; it is but a calm followed by a storm, which breaks out with tenfold fury, attacking the third and fourth generations with great intensity ; for leprosy, when left to itself, never dies out ; it follows its prey through successive generations, even to the last scion of the race. This hereditary character is to be regarded as the internal cause of spedalskhed ; it is the cause the most to be feared of all ; for the disease often steals unnoticed into a family, and then it never leaves them.”

Drs. Simpson and Danielssen assert that leprosy is an hereditary disease, although it may not appear among the members of even one or two generations ; but if it re-appears in the third, we are bound to consider that an hereditary taint is at the root of the evil. This fact is overlooked in several of the reports before us, and because the parents of the leprous patients have not suffered from leprosy, it has been argued that the disease is not hereditary ; before, however, arriving at

this conclusion, it must be ascertained if the patient's grandfather or even his great-grandfather, was affected with the disease. Another argument put forward as a proof of the non-hereditary nature of leprosy is, that we sometimes find only one member of a family suffering from it ; it would be necessary, however, in any such case to consider the probabilities of the relations of the diseased person subsequently becoming leprosy, and all chance of the patients having been inoculated from a leprosy sore must have been carefully excluded, before we can venture to give an opinion as to its origin.

These are the principal arguments insisted on by the disbelievers in the hereditary nature of leprosy ; but in opposition to them stands the formidable array of facts above noticed, which may be briefly summed up as follows. From the report before me, I find that eighty per cent. of the Civil Surgeons in this Presidency agree in thinking that leprosy is hereditary. The prevailing belief of both ancient and modern authors confirms this opinion. The natives of India believe the disease to be hereditary ; and a man and his wife are separated usually by mutual consent when the complaint has become fully developed, because they are aware their children will, under these circumstances, inherit the leprosy taint.

From numerous statements scattered throughout this report, it appears that the disease is at the present day mainly propagated by an hereditary taint from parent to child. The case before quoted of the Chittagong colony is much to the point ; these Portuguese being placed under precisely similar circumstances, both as regards climate, sanitation, and diet, as their native neighbours ; the only difference between them is that the latter intermarry, but the Portuguese keep to themselves, and the leprosy taint is thus excluded from their colony ; were they to marry natives, no doubt the seeds of the disease

would soon be introduced among them, and as surely spread, as it does throughout the native population.

From these facts, it appears without doubt that leprosy is an hereditary disease.

It is a most difficult matter to arrive at a definite conclusion as to the contagiousness of leprosy. From these reports, it appears that thirty-six medical officers are of opinion that the disease is contagious, twenty-six are doubtful on this point, and twenty-four deny that leprosy can be communicated from one person to another. The majority, therefore, are in favor of contagion; but it is expressly stated in several of the reports that "leprosy is only contagious in the ulcerative stages." If this point had been strictly attended to in the inquiries made on the subject, it is more than probable that much of the conflicting testimony found in this report would have been harmonized\*. It will be well, however, to quote some of the cases scattered throughout the volume before me, bearing upon the question now under consideration.

Dr. Rose remarks:—"H. DeSouza lived with my apothecary, Mr. Sneider (whose nephew he was), for some years, Mr. S. labouring under confirmed leprosy at the time, of which he died in 1861. Some time before death, extensive ulceration set in, attended with a profuse offensive discharge, but the lad contracted the disease before this appeared; Mr. DeSouza died last year with leprosy fully developed.

"Sheikh Hussain, a convict from the Madras Presidency, whilst acting as hospital orderly to Mr. Sneider above-mentioned, contracted leprosy from him, and died in less than

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\* Throughout this report, in mentioning the fact that leprosy is contagious, I mean, it may be propagated by the matter from a leprossore being inoculated into the blood of a healthy person, but not by simple proximity, or through the medium of the air.

twelve months from the time the disease first became manifest ; prior to death, ulceration of the hands and feet set in."

Dr. Hatehell remarks that "leprosy is not thought to be contagious among the people of this district ; but I have been credibly informed of the case of a woman who had manifested the first symptoms of it ; her husband had long been a martyr to it, and for three years previously the ulcerative stage had been fully developed."

Dr. N. Jackson gives the following case :—

"A woman, aged about 30, was attacked by leprosy. She had at the time of the attack a daughter, aged 16, who lived in the same house ; in five years' time this daughter was also a leper, and subsequently, in four years more, her husband became affected ; the disease now took a less direct line, and the next person who suffered was the last leper's eldest brother's wife ! who is no blood-relation to any one of these persons, but lived in the same house with them ; lastly, her husband became a leper after about two years. Whether this points to infection by sexual connection or not, it is impossible to determine, but it seems to me to point very directly to infection by prolonged contiguity ; and none of these people's ancestors were lepers, as far as they knew, for two generations back."

Dr. Thompson states :—"I know of one instance of the disease being communicated to a healthy person by direct and repeated contact while in its sloughing stage.

"A healthy child was in the habit of purchasing pet pigeons, much handled by a leper who had sloughing ulcers, and the disease after a short lapse of time broke out in its worst form ; the child died."

In Dr. Durant's list of cases :—



No.	Causes of the disease as stated by the patient.
5	By association with a bunia and eating food from him, who had the disease in an advanced form.
8	Caused by playing with children who had the disease.
27	Associating with a friend, who lived next door to him, who had the disease.
59	One of the school-boys of his school had the disease.

The Sub-Assistant Surgeon lately in charge of the Almorah Leper Asylum states that, during the year 1852, the chowke-dar and mehter of the hospital were healthy men ; in 1856, both of them were inmates of the Asylum, suffering from the worst form of leprosy. The following case is to be found at page 145 of this report :—

“ A Hindoo of the name of Nuttoo came to the dispensary yesterday ; he was accompanied by a lad about 14 years of age ; they were both suffering from leprosy, and the man gave me the following details of their case. He lives in the village of Herdaspoore, pergunnah Balegunge, of this district ; he has had leprosy for the last twelve years ; prior to this he had been perfectly healthy, and had six children, all of whom are alive and well ; he says his father and mother were not lepers ; as soon as he discovered he was suffering from leprosy, he ceased of his own accord to cohabit with his wife, and he lives entirely away from her and his family : none of them have become lepers. The boy he has brought with him is betrothed to one of his daughters ; his name is Botha ; Nuttoo and the lad’s father were great friends, and as they were both lepers, were likely to have known the history of one another’s cases, and he (Nuttoo) says that he cannot be sure if the boy’s father’s parents were healthy or not, but he knows that his

friend was attacked with leprosy fifteen years ago ; at this time he had been married for some years, and his wife was perfectly free from leprosy, and also their first three children, born prior to the development of the disease in the father. When the man discovered he was a leper, he pretended to absent himself from his wife, and Nuttoo says they never met except when the father visited her on the sly at night, and they cohabited with one another ; the mother, however, got the disease within three years of her husband, and this lad, Botha, was the first child born after the disease had made its appearance in the case of the mother ; he had two younger sisters, who both died young.

*Case No. 2.*—“Durbungee Chowdrie, village Hussar, pergunnah Paro, applied to me this morning at the dispensary for medicine ; he had leprosy, as also his wife, who came with him to the hospital ; they have been married for ten years, but have no family ; he says his father had leprosy, but died from fever many years ago. The wife declares none of her family ever had the disease, nor had she the slightest symptom of it until two years after her husband got it ; when she discovered he was a leper, she ran away from him, but he followed her and brought her home again,—and, as she expected, she is now a leper.”

The above are some of the cases to be found in this report, which directly bear upon the point under consideration. Dr. Simpson, in his article before referred to, page 412, remarks that the older medical authors—both Hindoos, Arabians, and Greeks—never appear to doubt the contagious character of the disease. These authors express a unanimous opinion on its contagious propagation, and it is not till we come down to the professional writers of the seventeenth century that we find this doctrine ventured to be called in question. To remove all doubt as to the identity of the leprosy of the



middle ages with that noticed in India at the present day, it may be well to quote the following passage from Barnhard Gordon's work on *Medicine*, written during the year 1309. He says:—"The occult premonitory signs of leprosy are a reddish colour of the face, verging to duskiness; the expiration begins to be changed, the voice grows rhoneous, the hairs become thinned and weaker, and the perspiration and breath incline to fœtidity; the mind is melancholie, with frightful dreams and nightmare; in some cases scales, pustules, and eruptions break out over the whole body; the disposition of the body begins to become loathsome;—but still, while the form and figure are not corrupted, the patient is not to be adjudged for separation, but is to be most strictly watched.

"The infallible signs are enlargement of the eyebrows, with loss of their hair; rotundity of the eyes; swelling of the nostrils externally, and contraction of them within; voice nasal; colour of the face glossy, verging to a darkish hue; aspect of the face terrible, with a fixed look, and with rotundity of the pulps of the ears. And there are many other signs, as pustules and exeresenees, atrophy of the museles, and particuarly of those between the thumb and forefinger; insensibility of the extremities, fissures, and infections of the skin; the blood, when drawn and washed, containing black, earthy, rough, sandy matters, and other marks which authors prominently mention, but for me, those suffice which are to be found in the face. The above are those evident and manifest signs which, when they do appear, the patient ought to be separated from the people, or, in other words, secluded in a leper-house.

"The signs of the last stage, and breaking up of the disease, are corrosion and falling in of the cartilage forming the septum of the nose; fissure and division of the feet and

hands; enlargement of the lips, and a disposition to glandular swelling; dyspnœa and difficulty of breathing; the voice hoarse and barking; the aspect of the face frightful, and of a dark colour; and the pulse small and imperceptible.

“No one ought to be adjudged as a leper, unless there manifestly appear a corruption of the figure. And I repeat to you this, because, as it appears to me, lepers are at the present day very injudiciously adjudged. Whoever, therefore, has ears, let him attend to this, if he will.”\*

We find that some of the earliest records of medicine in England refer to leprosy. Dr. Meade, in his *History of Physic*, informs us that one Gilbert, called Anglieus, who lived in the reign of King John, wrote a treatise on Leprosy. It is true, as Meade remarks, he wrote as well as any of his contemporaries in other nations, and did no more than they if he took the bulk of what he compiled from the writings of the Arabians; still Gilbert was a traveller, and had, no doubt, seen much of the disease he describes. We have, however, even stronger evidence than his of the rapid spread of leprosy in our own country and Europe about the twelfth century, for the date of the foundation of the first Leper Hospital in England is 1110; it was established at York; and between that date and the year 1472, there were no less than one hundred and twelve richly endowed Leper Hospitals erected in our own island. Michaud, in his *History of the Crusades*, observes, Vol. II., page 308:—“The historians we have followed are silent as to the ravages of the leprosy among the nations of the West; but the testament of Louis VIII., an historical monument of that period, attests the existance of two thousand hospitals for lepers in the Kingdom of France alone.” And this leads us to a very important question—how did leprosy find its way into Europe about this time? Michaud whose authority probably stands

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\* Dr. Simpson on Leprosy.

higher than any other writer on matters connected with the Crusades, has settled this point for us; he evidently takes it for granted that the disease was imported into Europe by the Crusaders and pilgrims who flocked to the holy places from all parts of Europe, during the eleventh and twelfth centuries. He remarks of the lepers to be seen in France:—"This horrible sight must have been a subject of terror to the most fervent Christians, and was sufficient to disenchant, in their eyes, those regions of the East where, till that time, their imaginations had seen nothing but prodigies and marvels." Writing of the experience, as regards medicine, gained by those who travelled with the Crusaders to the East (the School of Medicine), Michaud observes:—"It may be safely said that, during the Crusades, we received from the East many more serious diseases than true instruction in medicine. We know that there were numerous leper-houses established in Europe in the time of the Crusades, but we know nothing of the remedies employed for the cure of leprosy. Isolation appears to have been the only curative or preservative means known for this malady, which many learned physicians now look upon as mere prejudice. The spirit of devotion richly endowed lepers, without doing anything for their cure. Leprosy in the end disappeared without the assistance of medicine, and the property belonging to the leper-hospitals was transferred to the hospitals." The truth was, these old Crusaders were far wiser in their generation than the learned physicians above referred to; they took the only really practical means for eradicating the disease from society,—that of enforcing absolute and strict segregation of the leper. Now, unless leprosy were contagious, how could the Crusaders have brought it into Europe, and why should it have spread in the way it did among the population of the West? And, still further, I would ask how it is, that at the end of the sixteenth century, with the exception of isolated cases, it

had entirely disappeared? I have already given it as my opinion that the disease is hereditary ; and supposing it also to have been contagious, must it not evidently have disappeared, as we know very well it did, under existing circumstances? On the other hand, had the disease been anything but hereditary and contagious, would the treatment applied have stopped it in one part of the world, whereas, in another, where no such precautions have been taken, it still exists? I shall presently show that neither climatic influences, nor any other known causes, excepts segregation, could *alone* have produced this effect. Dr. Simpson observes, according to the record of Edward III., that that king sent, in 1346, “ a commandment under his Great Seal to the Mayor and Sheriffs of London, willing them to make proclamation in every ward of the city and suburbs, that all leprous persons within the said city and suburbs should avoid within fifteen days, and that no man suffer any such leprous person to abide within his house, upon pain to forfeit his said house, and to incur the King’s further displeasure. And that they should cause the said lepers to be removed into some outplaces of the fields, from the haunt and company of all sound people.” At page 425 of the same article, we find the following remarks :—

“ According to the tenor of various old civil codes and local enactments, when a person became affected with leprosy, he was looked upon as legally and politically dead, and lost the privileges belong to his right of citizenship.

“ Rothris, King of Lombardy, as early as the eleventh century, decreed that, when any one became affected with leprosy, and the fact was known to the judge or people, so that the leper was expelled from society, and dwelt in seclusion, he had no power to alienate his effects, or dispose of them to any one. For, it is added, from the very day on which he is expelled from his home, he is to be regarded as dead. The same was the law of Normandy, according to Dufresne and De-



clanarre; and Lobineau, in his *History of Brittany*, speaks of it being formerly in accordance with the rituals of various churches.

“ The leper was not looked upon in the eye of the law alone as defunct, for the Church also took the same view and performed the solemn ceremonials of the burial of the dead over him on the day on which he was separated from his fellow creatures, and consigned to a lazar-house. He was from that moment regarded as a man dead amongst the living, and legally buried, though still breathing and alive. The ritual of the French Church retained till a late period the various forms and ceremonies to which the leper was subjected on the day of his living funeral. Ogee and Pluquet have both described them.

“ A priest robed with surplice and stole went with the cross to the house of the doomed leper. The Minister of the Church began the necessary ceremonies by exhorting him to suffer, with a patient and penitent spirit, the incurable plague with which God had stricken him. He then sprinkled the unfortunate leper with holy water, and afterwards conducted him to the Church, the usual burial verses being sung during their march thither. In the Church the ordinary habiliments of the leper were removed; he was clothed in a funeral pall; and while placed before the altar between two trestles, the *Libera* was sung, and the mass for the dead celebrated over him. After this service, he was again sprinkled with holy water, and led from the Church to the house or hospital destined for his future abode. A pair of clappers, a barrel, a stick, cowl, and dress, &c., &c., were given to him. Before leaving the leper, the priest solemnly interdicted him from appearing in public without his leper's garb; from entering inns, churches, mills, and bake-houses; from touching children, or given them ought he had touched; from washing his

hands, or anything pertaining to him, in the common fountains and streams; from touching in the markets the goods he wished to buy with anything except his stick; from eating or drinking with any others than lepers; and he especially forbade him from walking in narrow paths, or from answering those who spoke to him in the roads and streets, unless in a whisper, that they might not be annoyed with a pestilent breath, and with the infectious odour which exhaled from his body; and last of all, before taking his departure and leaving the leper for ever to the seclusion of the lazaret-house, the official of the Church terminated the ceremony of his separation from his living fellow-creatures, by throwing upon the body of the poor outcast a shovelful of earth, in imitation of the closure of the grave." Treatment such as this not only stopped the progress of leprosy, but the disease was soon eradicated from Europe.

The following, therefore, are the facts I may educe in favor of the contagiousness of leprosy:—

*1st.*—A large proportion of the civil surgeons in this Presidency believe, from personal observation, that the disease is contagious.

*2nd.*—The instances quoted from this report can only be explained by supposing the disease to be contagious.

*3rd.*—It has been shown that the disease known as leprosy, and which exists among the natives of India at present, is the same form of disease which spread by contagion throughout Europe from the East, during the time of the Crusades.

*4th.*—Leprosy having become common among the inhabitants of the West, was absolutely and completely eradicated, in the course of a few centuries, by the forced segregation to which leprous patients were subjected.

*5th.*—It was the universal opinion of contemporary authors, who were the best judges on the subject, that leprosy was con-



tagious ; and by far the majority of natives believe it to be so now.

On the other hand, the non-contagionists might argue :

1st.—If leprosy spread to Europe through the intercourse which the Crusaders established with the East, and if the disease exists there now, the same sequence should occur from similar causes.

2nd.—If contagious, why do not more natives become affected with the disease ; lepers being allowed free intercourse with the population around them ?

3rd.—Some of the officers, whose reports have been quoted in this review to prove one set of facts (as, for instance, Dr. Sutherland), deny that leprosy is contagious ; why should their testimony be received as conclusive evidence on one point and not on another ?

I may briefly reply to these objections in the order in which they occur.

The intercourse which took place between the East and West, during the time of the Crusades, was of so utterly different a nature from that which exists at the present day, it is impossible to form a comparison between the two periods. William of Malmesbury, writing of the pilgrims starting for the Holy Land, remarks :—“ Joy animated the hearts of all who set out ; grief dwelt in the hearts of all who remained. Why do I say of those who remained ; you might have seen the husband setting forth with his wife and family ; you would have laughed to see all the *penates* put in motion and loaded upon cars. The road was too narrow for the passengers ; more room was wanted for travellers, so great and numerous was the crowd.” No less than three hundred thousands of these poor creatures followed Peter the Hermit into the East, though few of them, it is true, ever returned home again ; but they were a type of the hordes of Frenchmen who wandered away to the

Holy Land, undergoing terrible privations to get there, and frequently having to wander back through Asia Minor, where they were of course brought into immediate contact with the people of the country (who, we know from the accounts of contemporary authors, suffered from leprosy.) It is important to bear this in mind, because we have, under these circumstances, the soil prepared in which leprosy, like all other albuminoid diseases, loves to take root. There is good reason, however, to doubt if the filth and want to which these pilgrims were exposed, was in itself sufficient to create leprosy; for if so, we should have heard of similar results following under analogous circumstances in other parts of the world.

That leprosy does not spread among the natives of India by contagion, is in itself an hypothesis, but presuming it to be a fact, it may be explained; for although lepers move about among their countrymen, they are to a great extent isolated from them. Who ever saw a healthy native touch, much less eat, with one affected with leprosy? In many parts of India the mere fact of admitting a leper into a General Hospital, is sufficient to drive every other person out of it. The wealthy leper may purchase immunity from some of the social evils to which his poorer brethren are exposed, but even he is frequently obliged to leave house and home, and wander as an outcast over the face of the earth, visiting shrines and holy places, in expiation for his sins, which he believes have been punished by the infliction of leprosy. Rich and poor lepers, however, though living and moving among their fellow men, are, as a general rule, as isolated from them, as were those condemned to the lazar-houses in the middle ages.

There can be no doubt as to the fact that several of the medical officers, whose opinions have been quoted as authorities on certain points, do not believe in the contagiousness of leprosy.

I cannot, however, do better than refer to Dr. Sutherland's

remarks on this point. He writes, page 193,—“I have never been satisfied with the proof that the disease is infectious, and suspect that, in the supposed cases of infection, a leprous taint previously existed, and that the disease was inherited, or arose, from circumstances in the condition of the affected person, independent of infection. Natives will often touch leprous patients without dread of infection, and it is not uncommon to see at Patna numerous indigent people setting close together begging, some of whom have leprosy in an advanced stage, with loss of fingers and toes, the legs and feet bound with filthy bandages. A person in the lower classes afflicted with leprosy, becomes a beggar by profession.

I have not met with or heard of any well-authenticated cases where the disease was transmitted by sexual intercourse.” It will be observed how cautious Dr. Sutherland is. He does not deny that leprosy is contagious, but requires further proofs before he can be convinced of the fact. In the reports of the more careful observers, who have not given it as their opinion that leprosy is contagious, the same reserve may be noticed when expressing their views on this subject. There is not a single instance throughout this report, in which it is attempted to be shown that leprosy cannot be communicated from a diseased to a sound person by means of contact.

The arguments therefore against the contagiousness of leprosy do not refute those in favor of it, consequently, I can arrive at no other conclusion than that leprosy is contagious; *but it is necessary for the propagation of the disease by this means, that the discharge from a leprous sore should enter the blood of the healthy person*; and, further, the disease may even then (unless under peculiar circumstances) remain undeveloped in the system for years.

Having arrived at the conclusion that leprosy is both hereditary and contagious, I may proceed to inquire if the disease

has ever been developed by any other means. And first, as regards its spread by sexual intercourse, there can be no doubt that the germs of leprosy pass from the parent to the offspring, but we have yet to learn if it can be communicated from the infant (*in utero*) to the mother. The disease may spread from the husband to wife during sexual intercourse, because the male organs of generation are often ulcerated, and the female thus becomes inoculated with the virus.

In almost all the reports under review, the want of sanitation, together with climatic and dietetic influences, are prominently put forward as the causes of leprosy. With regard to climate, in a very able paper on leprosy by Dr. Hobson, as seen among the Chinese, (*vide Medical Times and Gazette*, June 2nd, 1860) he observes:—"Heat and moisture probably exert a considerable influence in keeping up the disease, if not in producing it;" and he argues, because leprosy is not seen in the north of China, it cannot therefore exist in a cold climate. This idea is hardly tenable; in fact, it cannot be admitted that climatic influences have power in themselves to generate or stop the progress of leprosy, because it is well known, that at present leprosy prevails in parts of Norway and Hindustan, in the Arctic Circle and China, Iceland and New Zealand, the Cape, Morocco, Mexico, the Sandwich Islands, Borneo, Batavia, throughout Asia Minor, parts of Russia, and Carthagenia. This list might be enlarged, but it includes such a variety of climates, that it would appear impossible the nature of any particular place can influence the disease; this remark applies not only to temperature, but to elevation above the sea, for we find leprosy spreading among the inhabitants of the table-land of Mexico, as well as among the hill tribes living on the slopes of the Himalaya. By reference also to the circumstances of this affection among the natives of India, the prevailing idea may be refuted that leprosy spreads prin-



cipally among those who live on the sea-shore; for it is very common in races living hundreds of miles from the sea, as in Behar, the North-West, and the Punjab. As leprosy, therefore, exists at the present day among human beings in every part of the globe, at all elevations above the level of the sea, both inland and on the sea-board, it cannot be admitted that any peculiar climatic influences are inimical to its spread, and still less that they are in themselves capable of generating the disease.

*Sanitation.*—The most frequent cause assigned for leprosy throughout these reports, is the want of personal cleanliness among the natives. Before allowing this as a cause of the disease, it would be well to pause and read some of our Sanitary Commissioner's remarks on the condition of the lower classes in various towns in Great Britain, and then to consider if it is possible the want of sanitation can generate leprosy; many of these reports pourtray the condition of our poorer classes as being miserable in the extreme, families consisting of several people crammed into one room, its members existing in a state of filth and degradation, which must necessarily have engendered leprosy among them if it depended upon defective sanitary arrangements. It has also been shown in a former part of this report, that the richer classes of natives suffer from leprosy in an equal proportion to their poorer brethren, and the want of cleanliness can have nothing to do with the spread of the disease in their case. These considerations compel me to abandon the idea that want of sanitation is a cause of leprosy among the people of this country.

*Food*, which is defective in some one principle, is said to generate leprosy; by some medical officers it is assumed that the diet of the natives is altogether deficient both in quantity and quality, and hence leprosy is developed; by others, some particular article of food is supposed to engender the disease.



Among the Norwegians, putrid and dried fish are said to give rise to leprosy; others fancy that rice prepared in a particular manner is at the root of the evil. We may be sure that the theory of bad and salted fish, being a cause of leprosy, does not apply to this country, for the natives, as a general rule, do not eat salted food, and certainly are not in the habit of consuming putrid fish, and so with regard to badly prepared rice, we must be able to prove, if this be a cause of the disease, that it is eaten by those commonly affected with leprosy, which is far from being the case; for not only is this article of diet unknown to the inhabitants of many countries where lepers are to be found, but we should find the theory utterly fail with regard to the spread of the disease among the inhabitants of Europe in the middle ages. It has already been remarked that leprosy is very common among the people of Behar, and at page 143 of the report before us, the following is the description of the dietary ordinarily consumed by the inhabitants of that province:—

“The natives, as a general rule, live in small mud huts, in which they cook, eat, and sleep; they use no furniture, squatting on the ground, and eating with their hands; their clothing consists of a light cotton garment thrown over the shoulders, and another round the loins; in the cold season they wear, in addition, a blanket; their houses are kept clean, and the sanitary conditions of their dwellings are infinitely superior to that of the poor in any of the large towns in England.

“They are, on the whole, cleanly in their habits; a native, under any circumstances, will bathe at least once a day.

“The population may be divided into four classes: the first composed of Brahmins, &c., &c., including about 40,000 of the three million inhabitants of this district; they consume in the morning about a pound and a half of bread made of

wheat with four ounces of dâl (a kind of pea), an ounce of butter with vegetables and salt, and half a pound of fish or flesh; in the hot season they often take milk in place of animal food; in the evening they eat a meal consisting of a pound and a half of rice with about the same quantity of dhye, or the curd of milk, and two or three ounces of dâl with butter and vegetables: sugar, spice, &c., are all added to improve the taste of the above articles of diet.

“The second class or Koormees, constituting about 80,000 of the population of Tirhoot; they usually take two meals a day: in the morning they consume a pound or a pound and a half of bread made of Indian corn and barley, together with three ounces of dâl and one of butter, to which they add usually, on three or four days of the week, half a pound of fish or flesh and vegetables; at night they take a pound and a half of rice, with two ounces of dâl and a little butter, and half a pound of dhye; they drink more or less spirits, according to taste.

“The third class, which, if we include the lower order of Mussulmen, amount to nearly two millions, eat in the morning a pound of bread made of Indian corn and barley, or a pound and a half of rice, together with three ounces of dâl and a few vegetables, frequently to this they add some flesh: in the evening they usually take a pound of rice with a few vegetables, and salt; they drink spirits.

“The fourth class are the Mussulmen. As regards their diet, they live much like Christians, and, with the exception of spirits and pig’s flesh, consume the same articles of food as we do.

“I need hardly say that it is out of the question my attempting to describe the multitude of occupations which engage the attention of the people of a large district like this, nor would it at all elucidate the subject, as no class is free from leprosy.”

Food of this kind appears well situated for the natives of a tropical climate, and at the same time it differs so completely from that of the Norwegians or people of the Sandwich Islands, that it is hardly possible to conceive two such dissimilar dietaries could give origin to a disease like leprosy.

While, therefore, excluding climatic, sanitary, or dietetic influences as being definite causes of leprosy, I am by no means prepared to affirm that one or all of them have not a marked influence upon the progress of the disease; presuming that it has once been engendered in the system either by inoculation or an hereditary taint, any causes which then tend to impoverish the vital powers must promote the progress of the affection. This fact is well exemplified in Dr. Durant's report, page 30. He observes:—

“The conditions or circumstances of life which seem to accelerate or aggravate the disease when it has once manifested itself in an individual at this place, seem to be the following:—Poverty, excess of bodily labour, deprivations, or distresses of any kind, chiefly those caused by long journeys or pilgrimages to Juggurnauth, insufficient nourishment, absorption of impure air, such as from living in unhealthy localities, confined habitations, and lying out in the open air, and exposure to inclemencies of season, chiefly during the monsoons and cold weather; indulgence in intoxicating drugs, such as the preparations of hemp and opium, dissipations of all kinds, particularly excess of venery (as was the case with the late Rajah of Pooree, who, as I said before, died from this disease and syphilis at an early age), want of proper medical and other hygienic means, and the abuse of remedies, such as mercury, which is sometimes prescribed by the ignorant quacks in the early stages of the disease, mistaking it for syphilis, not to mention the existence of a serofulous or syphilitic taint;—these, then, seem to be the most common aggravating circumstances

of the disease as I have seen it among the people here. Instances of each particular one mentioned have repeatedly come under my notice, as they have been treated at the Pilgrim Hospital. I may mention that, of all the causes I have enumerated sufferings from long journeys, such as caused by bad food bodily exhaustion, and exposure to inclemencies of the season, seem to exercise the most deleterious effects in aggravating the disease and hastening it on to a fatal termination. Many a life has been frequently prolonged under such circumstances from proper treatment, nutritious diet, and proper shelter afforded them in the Pooree Pilgrim Hospital, where these unfortunate sufferers have constantly been taken in."

From these facts, therefore, I have arrived at the conclusion that leprosy is an hereditary and contagious disease; and that no other circumstances can possibly generate it.

V. Has any provision been made for the cure of leprosy patients, either by the Government or by private charity, in the Bengal Presidency? The answer to this question is simply—no; nothing has as yet been done, and hundreds of these poor outcasts are wandering about over the country, many of them in a state of fearful destitution and want; in fact, the picture drawn of their condition in these reports is probably hardly exaggerated, and yet it is affirmed that in some instances lepers are eaten alive by jackalls and other wild animals. As the disease advances, the patient's hands and feet rot away, and ultimately he becomes incapable of defending himself against the attacks of vermin; the worse he grows the more loathsome is the disease, and the less will his countrymen assist him, till at last, from exhaustion and fatigue he lies down in a ditch or open field, and his fate, it is to be feared, is often the fearful one above mentioned. When we consider that in this presidency there are about a hundred million peo-



ple, and that in some places one in sixteen of the population are affected with the taint of leprosy, we may imagine the extent of misery which this terrible disease must inflict.

As far as I know, there is not a single hospital in this Presidency supported by Government for the relief of leprosy patients. In Calcutta there is a leper asylum maintained by private charity, and capable of holding some forty patients (the population of Calcutta is about half a million). At Benares, again, there is a building called a leper hospital with sixteen beds in it; the inhabitants of the city being 185,984 souls. There are a few other institutions of a similar nature scattered over the country, which might afford a resting place to one hundred, or at the outside two hundred, lepers. What a contrast does this state of things present to that existing in Europe during the middle ages. We read of no less than 2,000 richly endowed leper asylums springing up in France within a few years of the appearance of the disease, whereas in India, where it has existed probably since the introduction of the human race upon the earth, there has actually been no provision whatever made for lepers up to the present time. Our Chinese neighbours set us a good example in this respect, for Dr. Hobson tells us that for the town of Canton alone, the native Government maintain an hospital capable of containing one thousand lepers. And, again, Dr. Hillebrand says of the Sandwich Islands:—"Leprosy has invaded almost every district of our island group, alarms the people, and seriously occupies the attention of the Government and Legislature, who during the session of 1865 voted the comparatively large sum of 30,000 dollars for the establishment of a secluded hospital and leper village, in an isolated locality, on one of the smaller islands." In answer, however, to the question before us, it may be affirmed that, with the exception of a resting place (four walls with a roof over them cannot be



called an hospital) for some two hundred lepers at the outside, there is no special provision for lepers in this presidency. I may remark that they cannot, as a general rule, be taken into our hospitals, for most of the native patients would leave at once if a leper were admitted.

VI. Are there any known means for mitigating the progress of leprosy?

The segregation of leprosy patients would no doubt stop the spread of the disease now as it did in the middle ages; and though it might not be possible to enforce such a strict separation of the infected from healthy people as was formerly practised, still very much might be done in this direction. Dr. Rose mentions, at page 495 in the "Report on Leprosy," that at Malacca no restrictions are imposed by Government at present at either of the three settlements; as to the segregation of lepers, they mix freely with the rest of the community, but are always avoided; still, at any time of the day, in any street, you are sure to meet two or three of these miserable creatures; their appearance is disgusting in the extreme; they are frequently taken up by the police and sent to prison, where they know from former experience they are sure to be sent to hospital, and be well fed and cared for; whilst in hospital, I keep them separate as much as possible.

Government have a leper ward attached to the large Pauper Hospital (built at the expense of a wealthy Chinese named Tan Toek Seng) where lepers are received, but they manage to escape and prowl about seeking alms—a nuisance to the whole community.

At Malacca and Penang, however, large sums of money have been subscribed by the richer natives of all classes for the erection of a leper hospital, so great is the dread they have of the disease; and Government have given over Pulo

“Siranbon,” an island contiguous to Malacca, where a comfortable Lazaretto has been erected, to which lepers are removed at their own request, I believe (as I repeat there is no Act at present in force to compel them), where they are comfortable enough, growing their own vegetables, &c.; they seem contented enough; their food is sent out from time to time from Malacca. At Penang, in a very few days, upwards of \$20,000 was readily subscribed, and Government have given over the lovely island of Pulo “Jerajah” to the committee, where a roomy poor-house, hospital, and Lazaretto are being erected. I have just reported it to be an excellent site, and the plan of the hospital is well adapted in every way for the purpose intended.”

With regard to hospital accommodation, it is absurd to stick up four walls in various localities, and placing a roof over them, call an edifice of the kind a leper hospital, and then flatter ourselves we have made a proper provision for these poor creatures. Unless the circumstances of the leper are thoroughly understood, and unless the charity bestowed on him is disbursed judiciously and honestly, it had far better be withheld *in toto*; the mere fact of giving, because something must be done to escape the reproach of utterly neglecting the claims which these people have upon us, savours strongly of hypocrisy, and will certainly fail to effect any lasting good. By the above remark, I do not for an instant mean to imply that funds collected for a charitable purpose of the kind are likely to be stolen, but unless they are distributed by those who take an honest and zealous interest in the people and cause in hand, they will be misapplied, which amounts to much the same thing as far as the recipients are concerned. However, this is progressing rather too fast before discussing the means to be employed in administering to the wants of the leper; it would be ad-

visible to consider if we are likely to get any funds to disburse. I cannot turn with confidence to the wealthy natives of India or to Government for aid. The individual members of the Supreme Council might be inclined to help these miserable lepers if they could, but they have no State funds at their command for the purpose, and the lepers will have to wait a very long time for assistance from these sources. If their condition could be realized by our countrymen in England, they would, under ordinary circumstances, receive sympathy, if not substantial aid; but the home cry at present is loud for improved sanitary arrangements for our European troops in India; it will be necessary to satisfy this demand before other subjects of a similar nature will be attended to, and justly so, for to England the matter is of vital importance. But while attending to the welfare of the British soldiers, the fact should not be overlooked that the poorer classes in this country constitute the motive force by which the machinery works, from whence the funds necessary for carrying out these improvements must be derived, consequently, if only on the give-and-take principle, the lower classes in India demand some consideration from us. The order of the day, however, appears to reverse this doctrine, for it appears to be a matter of consideration with the Government, whether they cannot save something by suppressing their local dispensaries, and turning the jail hospitals into *the* one Government medical establishment in each district, thus practically destroying the medical relief at present afforded in each division to the poorer classes. And so again, with regard to our Superintending Surgeons, it is reported that their numbers are to be reduced, and their work confined almost exclusively to the supervision of our European troops; and yet we frequently meet with notices like the following in our daily newspapers:—

*Englishman, January 26th, 1866.*—“ We hear from Mymen-

sing that a fever of a deadly kind has broken out in that district, and that a large number of the inhabitants have fallen victims to the disease. The matter has attracted the attention of Government, and the Commissioner of the division has been directed to furnish whatever information is available on the subject." It may naturally be asked why an unskilled Commissioner should be called on to furnish a report on fever. Just as reasonably request the Superintending Surgeon to send in an account of the revenue of the district. A vast deal of good might be done if the Superintending Surgeon of each division were an officer conversant with the language and habits of the people, and were freed from the drudgery of compiling returns, but allowed to expend his energy and time in travelling over his district, taking his tents with him, and living among the people during the cold season, gleaning information from them regarding endemic disease, and being, in fact, as he should be, the health-officer of his division. Considering that in this presidency alone there are, as before stated, upwards of one hundred million human beings, surely a dozen medical officers would have enough to do to guide and advise Government as to the best appliances to be employed to stay the progress of the fearful endemic disease which yearly destroys hundreds of thousands of human beings in this country. The attention of these officers should be entirely confined to the well-being of the natives, and the fewer returns they have to make the better; their annual reports being the only documents required, and these should be published and circulated (both in the English and vernacular languages) throughout the country. If a system of this kind were enforced, the circumstances of leprosy and other such scourges would be better understood than they are now, and means to thwart their progress would, in all human probability, soon be devised. These are the only general remedial measures that can at



present be advocated for the relief of leprosy in India. The natives of each province differ so remarkably in their habits, that facts relating to these varieties (of which we know little or nothing at present,) and their social peculiarities, must be studied before appropriate means can be applied; in some localities leper asylums would answer best, in others leper villages, but in all there is a vast deal to be done, which can only be effected by first obtaining reliable data upon which to act.

This plan is recommended with confidence, because it is a practicable one, and consistent with the nature of the case; it is simply absurd to speculate on the advantage to be derived from costly establishments and hospitals, if there is no possibility of obtaining the funds to build and support them with; but let us know exactly the localities and extent to which leprosy prevails, the feeling of the people regarding it, and if they would be likely to congregate in leper villages, and where these should be situated: exact information upon these and numerous other points of the kind would place us in a position to recommend the adoption of means which would certainly result in success. (See note at end of this report).

A work of this kind could not possibly be completed within five years, for it must be done thoroughly, if at all.

With regard to the treatment of leprosy, I have before remarked in all instances of this disease, there are marked premonitory symptoms; and in this stage its progress may be stopped by the judicious administration of arsenic, combined with the extract of neam. The chaul moogra oil is also very useful; it may be rubbed into the skin or taken internally; at the same time it is absolutely necessary the patient's general health should be attended to, all depressing influences being carefully removed, and a generous dictary, exercise, cleanliness, and fresh air being strictly enforced. If leprosy has become fully developed, no human skill can cure it, but much may



still be done to stop its progress, and mitigate the sufferings it causes, the drugs above mentioned being administered, and also the powdered root of the mudar. Unless, however, the poorer classes have proper establishments provided for them, as well as medicines, it is impossible to expect that they can obtain permanent relief: there is no specific for leprosy, and each case will consequently require special treatment.

I have purposely avoided making any remarks on the pathology of the disease, because the subject is hardly mentioned throughout the report before me. I believe, however, that leprosy depends upon an albumenoid degeneration of the affected tissues. The Norwegian physicians, as far back as 1847, had demonstrated the fact that the spinal cord, the lymphatic glands, and mucous and serous membranes, together with the outer coats of the larger vessels and neurilema of the nerves, were frequently the seat of the lardaceous growth; and more recently Dr. Carter, of the Bombay Medical Service, has noticed marked changes in the trunks of the nerves leading to those parts of the body affected with leprosy; and he attributes the symptoms of the disease to the alterations thus induced in the functions of the nerves. The pathology of leprosy, however, requires further investigation, and its study would well re-pay those who have time and opportunities to devote to the subject.

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## NOTE.

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I am convinced these matters are well worthy the consideration of Government. British rule has doubtless done a vast deal for India; it found the country in a state of anarchy and ruin, and from this chaos order and protection have been secured to all classes; and now that peace and tranquility reign throughout the land, surely no more beneficial work could be undertaken than an endeavour to overcome the ravages which epidemic and endemic diseases annually commit among the people. Upwards of two hundred millions of human beings in this country—whose voices are never heard, who are unrepresented either by public opinion or in any other way—are dependent wholly and solely upon their physical condition, not only for their own maintenance, but upon their power to work depends the existence of their families. The father and mother (we may suppose) of a family of six children are carried off by cholera; there are no poor laws, no work-houses, no charities from which their orphan children can receive relief; their relations may help them as far as practicable, but they again live from hand to mouth, earning only just sufficient to keep them going, so that in the vast majority of instances, the sickness or death of parents among the lower classes is followed by the death of those of their children who are unable to work for themselves. Not only is an amount of untold misery thus caused, but the State loses a vast store of force which was never created to be squandered in this way. Taking, therefore, the lowest and most sordid view of the matter, Government is bound to do all in its power to improve the health of the lower classes, because the fearful mortality at present existing among them is a direct and positive loss to the State.

These ideas have been reiterated by Indian medical officers for the last century ; and yet, up to the present time, not even an attempt has been made to compile a history, nor have we gained the slightest clue to the causes which give rise to or diffuse these fearful epidemic diseases. It is true there has of late been an effort made in this direction as regards our European troops, and with a sanitary commission to back the advice of able medical officers, much has been done, and a vast deal more will be done, for our troops ; it cannot therefore be argued that science is at fault in this matter : on the contrary, we have ample proof that when the advice of officers conversant with the science of sanitation has been adopted, sickness and mortality have wonderfully diminished. We may not be able to cure cholera, nor is it likely we ever shall hit on a specific, if we trust to the present system of firing random shots in all directions at it—every man having a theory of his own on the subject. But it is more than possible we should be able to prevent the inroads of cholera, if we carefully studied the circumstances of the progress of the disease, especially among the natives. There is no short road to knowledge ; but a patient and well directed course of investigations would certainly lead to the elucidation of the truth. Nothing, however, has as yet been done in this direction. Every civil surgeon knows that hardly a year passes without a wave of cholera spreading over his district ; those only, however, who have watched the fearful desolation which an epidemic of the kind causes, can realize its extent. It often happens, when cholera fixes itself on a village, that in three or four days every house in it loses one or more of its inmates ; the disease increases, and those who remain are often seized with a panic, and the place is deserted except by the dead and dying. *This goes on year after year throughout the length and breadth of India, and yet, as far as I know, not the slightest official notice is taken of it.*

The argument thrown in one's teeth is, what can you do for the natives, they are so apathetic, dirty, and prejudiced, it is impossible to help them ; cholera pills are distributed through the police (who, however, never give them away unless they are paid for them) ; and what more can be done ? Certainly nothing, unless an effort is made, but as yet nothing worthy the name of an attempt has ever been made in this direction. It will be distinctly understood I am not now discussing the means to be taken for the cure of a person attacked with cholera : our endeavours should be confined in the first instance to discover the laws which govern the spread of this disease, and then to its

prevention ; but taking into consideration the fact that we have no evidence to enable us to arrive at a safe conclusion on the subject, it is absurd to talk about the natives refusing to profit by our instruction. It would be far wiser to accept our position and plead ignorance, rather than rest upon theories. We are apt to talk about malaria, the poison of cholera, and so on, as if we knew all about them ; one man accounts for an epidemic from over-crowding, a second from bad water, and a third from the effluvium from decaying animal matter ; if all these exist together, the cause of the disease is supposed to be positive and plain enough : but when one meets with isolated cases occurring under entirely different circumstances, our friends console themselves by saying —“ Instances of this kind will occur, there is no accounting for them.” No doubt cholera often breaks out when a vast number of natives are congregated together, as Dr. Montgomery, of the Madras Sanitary Commission, has shown in the case of the meeting at Conjeveram ; but a case of this kind must be analysed before we can consent to attribute the cholera to over-crowding. How many of these 200,000 strangers would have had cholera had they remained in their own houses, and exposed themselves to the depressing and other influences he describes as prevailing among the assembled throng at Conjeveram. If we could ascertain this point, we should be in a position to consider the influence which the aggregations of these people together might have had in causing the development of cholera among them. The Government has the means, however, at its command for collecting evidence, and establishing facts, bearing upon all the points necessary to the elucidation of the laws which govern the diffusion of epidemic diseases. There can be no doubt that cholera and other epidemic diseases abound in India, while the whole of this enormous country is directly under the supervision of the civil and medical officers of Government, so that the field from which to collect facts is unlimited. A proof of the ability and willingness of civil surgeons to enter on investigations of the kind is apparent from their reports on leprosy ; the materials constituting this large volume were collected in a very few months from them. I simply refer to it as a proof that, when civil surgeons feel that their work will be appreciated, and that they are not simply asked a string of questions, the answers to which will never be made any use of, they are ready enough to respond to the call. So far, therefore, the Government possesses a highly educated set of medical officers, scattered throughout every part of their dominions, who will work for the advancement of the

important subjects above alluded to; and, as I have before observed, if their returns were made to the superintending surgeons of the division, this officer being enabled to perform functions similar to those carried out by our health officers at home, and if the result of the combined annual reports for the whole of India were compiled by a registrar general, an amount of information would in a few years be collected, which would certainly lead to the most important results, and that with but little cost to Government.

The want of statistics would doubtless be felt as a great evil, but much might be done in the rural districts to obtain these, and surely a work of the kind might progress to a vast extent without waiting for statistics, which, after all, are frequently used in a very illogical way, and the health officer, in conjunction with the magistrate, could do much towards arriving at a proximate conclusion upon these points, in their annual tours through their various districts. My object is not, however, to enter upon details; these ideas have frequently presented themselves to my mind, and the utter absence of any provision, or positive knowledge as to the condition of lepers in India, as shown by the report I have lately been studying, has led to the above remarks on the subject; the pith of which is, that the functions of Government in a country like this (as applied to the lower classes) do not end in making laws and regulations; life and strength are far more important to these poor creatures, and it is undoubtedly in the power of the legislature to mitigate an enormous amount of the disease at present existing from epidemic causes; bearing in mind always that as yet nothing has been done in this direction, and that a well-organized and patient investigation into these matters would confer a blessing on the masses in India, which no amount of laws, education, or anything else can possibly give them.

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## LETTER FROM DR. HILLEBRAND.

*(Of Honolulu, Sandwich Islands.)*

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*Calcutta, February 3rd, 1866.*

DEAR SIR,—It is with the greatest interest that I have read the manuscript of your review of the reports on leprosy, the more so, as the conclusion you arrive at substantially agrees with the opinion which I had formed myself on the subject, from facts brought to my knowledge on a new and distant field of observation. In particular, I was glad to see you recall to the attention of the profession the powerful lessons to be drawn from the study of the history of the disease in the middle ages, during its inroad upon the nations of Europe.

The arguments which you have drawn from a critical examination of that history can hardly be gainsaid. It is during the invasion of new countries and fresh nations by obscure diseases, that the laws of the same can be most easily traced, because a starting point, with regard to time and place at least, approximately may be found out, from which the further growth and spread of the disease can be tracked. These conditions given, the laws by which the multiplication of the disease takes place become more manifest. It is on this account that I consider the study of the leprous invasion of Europe in bygone centuries of such great value for elucidating the question at issue; and it is for the same reason that I attach great importance to the facts which I am about to bring to your notice.

In the Sandwich Islands, where I have been living ever since 1851, practising the profession of medicine, and to a great extent among the natives of the country, leprosy was unknown before 1859, and after close scrutiny cannot be traced further back than the year 1852, or at the most 1848. A recent census, taken by the Government, established

the number of lepers to be about 230, out of a population of 67,000 natives, or nearly  $3\frac{1}{2}$  in one thousand. As I have good reason, however, to believe that only cases with marked tubercular development have been reported, the simply anæsthetic form not being generally recognized as being of leprous character, this estimate falls rather short of, than exceeds, the reality, which may safely be estimated at four in every 1,000. The character of the disease was first recognized in August 1859, shortly after the establishment of the Queen's Hospital and Dispensary. It then occurred to me that I had met with similar cases occasionally, but rarely before, the first of which I could recollect as far back as 1853. Further inquiry among the natives at large brought to light that a few had been observed in 1852 and 1851; and an old chief, well versed in the history of his country and in everything pertaining to his countrymen, referred the first case known to him to the year 1848. In 1859, when I first brought the existence of lepra amongst our people to the notice of Government and the public, only a few cases became known, but with every subsequent year the leprous patients presenting themselves at the public dispensary increased in number, until during 1864 and 1865 it was considered of quite ordinary occurrence that lepers should apply for relief. It is worthy of notice that, soon after the character of the disease became known, the native began to call it "mai pake," the Chinese disease. Whether this name derived from a belief that the disease had been imported through Chinamen, of whom there have been a considerable number settled at the island for years, or if it simply owed its origin to the circumstance that they learned from the Chinaman that the disease was common in China, I have not been able to ascertain.

Here then, we have the important fact of the leprous disease introducing itself amongst a clean nation, spreading slowly at first, so as not to attract attention for many years, but multiplying faster as years roll on, until, after the lapse of at most seventeen years, it has invaded almost every district of our island group, alarms the people, and seriously occupies the attention of the Government and Legislature, who, during the session of 1865, voted the comparatively large sum of 30,000 dollars for the establishment of a secluded hospital and a leper colony, in an isolated locality on one of the smaller islands; in fact, it is regarded as a national calamity. And mark well, in all this hereditary taint, from the nature of the case, has no share, or if any, only a most subordinate one. I can only remember a single child under the age of 6 years, among the great number of cases which have come

under my observation. Only one instance, where father and child were effected, can I recall to memory, and in that case the child was born clean, before the disease had broken out in the father.

The question next arises—Have changes taken place in the habits or ways of living of the people, for the worse? Do they live on poorer and less wholesome food now than formerly? Are they clad more scantily? Do they live in worse constructed houses? in a word, are they exposed to the ineleneies of the weather? Are they borne down by oppressive taxation, by forced labor, or anything tending to lower their vital forces, and thereby to prepare a soil well adapted for the spontaneous generation of such a disease? Quite the reverse; on all these points they are better off now than at any time before. Their food is the same which it used to be, *viz.*, a paste formed of the tuber of the *colocasia esculenta*, a tuber richer in gluten than any other. The country is well stocked with cattle, sheep, pigs, fowl, fish, &c., and animal food is within the reach of every one; for labor is in great demand, and highly paid. While, in former times, a girdle round the loins constituted their whole wearing apparel, now they are decently dressed like Europeans; their former dark and damp straw-huts are rapidly making room for pretty wooden structures, raised from the ground, and well-aired. The climate is perhaps the finest in the world, the thermometer ranging between a minimum of 60° and a maximum of 88°, the trade winds blowing uninterruptedly during summer; malaria is all but unknown. They live under a free constitutional Government; and taxation is light. It is true, syphilis has, as in most Polynesian tribes, sapped the life of the nation, and is the main cause of the lamentable decrease of the population; but syphilis and the decrease of population were going on long before the appearance of leprosy, and are making less progress now than before. And moreover, although lepra invading a body tainted with constitutional syphilis, or having syphilis implanted upon it, assumes a more virulent character, it has been found impossible to make out a specific affinity between the two dyscrasias.

It is also a notable circumstance, that a considerable number of those affected, and some even of the worst cases, belong to the better class of natives, who are well off in every respect.

As to the mode of diffusion over the group, I have been able to gather a few important facts. The first leper seen by me in 1853 lived then in a thinly populated district of the island of Oahu, about twenty miles from Honolulu, in a small village near the sea. When, in 1861, I made inquiries about this man, I learnt from the most trustworthy source that he

was now in a far advanced stage of the disease; and that in his immediate neighbourhood, six other persons had been taken with it. The same thing was observed in the district of Northkona Hawaii, where, towards the end of 1864, about seven cases became known, six of which were reported to have contracted the disease in the village of Kaslua, the tax-collector of which place had, for several years, been the only leper in the district. It must be observed here, that the natives are of very social disposition, much given to visiting each other, and that hospitality is considered as a sacred duty by them. Honolulu, the principal sea-port and the capital of the kingdom, of course contributes the largest number to the official lists, while one or two of the remotest districts of Hawaii, which have but little intercourse with the rest of the group, were, at the time that the census was taken, yet exempt from the disease. With the patients presenting themselves at the dispensary of the Queen's Hospital, I have made it a rule to ask to what cause they severally attributed the origin of their disease. About one-fourth avow contact with other lepers as the cause, a proportion which may be considered high, considering the shortness of time that the disease has been known, and the long term of incubation, during which the poison must lay dormant in the body, before it manifests itself.

In one family I hear, of a brother, a sister, and all individuals between 14 and 35 years, hereditary taint is of course out of the question. It is well to remark that all these observations refer to tubercular leprosy, which, in an overwhelming majority of cases, has been found combined with anæsthesia, either in the extremities, or in the affected parts themselves, and generally associated with squamous eruptions of the skin—psoriasis. The tubercular affection does not confine itself to the cutis, but can be followed up the nares, producing ozæna, and to the palate and epiglottis, causing sometimes death by laryngeal phthisis. It appears on these mucous membranes under the form of small lenticular or pisiform knobs which undergo a gradual ulcerative absorption, but never form large or deep corroding ulcers, as does syphilis, from which also the cicatrices are entirely distinct. Simple anæsthesia of particular nervous provinces in the forearm, particularly the ulnar, with contraction of one or more fingers, but without any ulceration of the affected skin, I have occasionally observed also, but their leprous character was not fully acknowledged. Since I have visited China and India, however, all doubts on that point have disappeared from my mind.

Without indulging in loose speculations about the nature of the conta-



gion, supposing such to exist, I believe myself borne out by facts when I attribute to it the following character :—

1.—It must be of a fixed nature, either solid or liquid, not diffusible through the atmosphere. 2.—It has an unusually long period of incubation. 3.—It cannot take root in every constitution; or, in other words, some men possess an immunity from its attack. These three laws or characters all tend to beset the investigation of the subject of contagiousity with difficulties, and are as many sources of error. If we could resort to inoculation, all these doubts might be cleared up; but fortunately or unfortunately, there are few bold philanthropists like a late Pasha of Egypt, who placed condemned criminals at the disposal of a physician for the purpose of being experimented upon by the inoculation of plague virus. And yet the results to be obtained from a systematic inoculation of leprosy products might become of immense value to mankind, as they would either point out a certain way of protecting society from the ravages of this loathsome disease, and finally eradicating it, or would at once, and for ever, put a stop to all useless measures tending to increase the already great misery of the poor, afflicted by additional restraints and disabilities. In some countries, the belief is prevalent that poultry and pigs are liable to take the disease; it would be well to make inquiries on the subject.

That the contagion must be of a mixed nature, I believe all advocates of its existence will admit at once. I have never heard of a case sincerely brought forward, in which the disease was said to have been communicated without contact. I venture to add that it requires prolonged contact, or may be, reception through an abraded surface, in order that it may become active. Perhaps also, it requires a particularly favourable condition of the nervous system, as may be supposed to exist during the state of general excitement accompanying cohabitation.

On the second character, that it has an unusually long period of incubation, it will be necessary to speak more at large. The periods between the time that the germ of the disease is said to have been contracted, and the real outbreak, extend, according to the patient's own statements, from a few months to several years. This length of incubation is a great anomaly in the history of contagious diseases; it finds its only distant parallel in rabies canina, in which the attack has been reported to follow the animal's bite, after the lapse of nine and even twelve months. It is true that, in such cases of rabies, an explanation has been attempted, by supposing that the virus lay encysted, and thereby isolated from the



inoculation, until, by some accident, it were set free. But we are forced, any how, to believe that the germ of the disease can lay dormant in the body for an indefinite length of time, even if we exclude the doctrine of contagion ; for, in a great number of cases which are set to the account of inherited predisposition, the disease did not show itself till after the patient had passed his 25th, 35th and even 45th year. Nay, more, it is asserted by many, and probably correctly, that the disease may remain latent through a whole generation, and only revive in the next one. It is true that this circumstance would approach the laws of our disease to those which rule in the albuminous dyscrasies—scrofula and tuberculosis—and this much the contagionists will have to concede to their opponents. Another very momentous question, however, will then arise—May not an originally contagious disease, by passing through one or more generations transform itself into a hereditary dyscrasy? Take syphilis for example.

As I have alluded to inoculation before, let me relate to you a fact which was communicated to me in Batavia, at the office of the chief of the medical service, by a medical man, himself a strong antagonist of the contagious theory. The case is said to be well known in Batavia, as it affects a member of a respectable family. In Portianak, Borneo, a child, about 9 years old, of pure European parentage, in which not the slightest trace of hereditary taint existed, was in the habit of playing with a leprous child of color.\* During play, the leprous child took a pin or a penknife (I do not remember which) and thrust it into the anæsthetic diseased skin of his leg, without expressing any pain. The astonished white child asked for the pin or knife of his playmate, and tried the experiment on himself, thereby causing himself severe pain, so as to impress itself strongly on his memory. Some time after, the child was sent to Holland to be educated, there studied law, and when nineteen years old, returned to Java a confirmed leper. The disease had appeared in him two years before his return. The latter circumstance is an acknowledged fact, as the gentleman is well known in Batavia, and his affliction has been the object of universal sympathy. Was this a case of inoculation? I admit that the data given are not sufficient to warrant this conclusion, but certainly it has been contagion ; and in one case or the other, the period

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\* The Nolvera Islands have, of all Dutch possessions, the greatest number of lepers. The disease has existed there from time immemorial, has leavened, as it were, the whole native race, and is not considered contagious. The lepers are not sequestered, but freely live and associate with the sound part of the population.

of incubation must have extended over several years. As I received this communication only two days before my departure from Java, I have not been able to make further inquiries into the details of the case, but I consider it of sufficient importance to deserve the fullest investigation.

That not every one is liable to receive the contagion, must be admitted by all who believe in its existence. In fact, the strongest arguments of the opponent are derived from observations falling under this head. One of the strongest cases was related to me in Java by a medical man, who had been a resident of Ambon. A Dutch missionary, long a resident of that place, married twenty years ago a half caste woman born there. At the time of their marriage, she was sound, although leprous taint existed in her family, but two years after the disease broke out in her. The good *domine*, partly from genuine affection, partly from religious motives, did not set her aside, but has continued to live with her up to this day. They have had several children, two of whom are lepers, but the husband has remained sound. Dr. K. B. Stewart, of this place (Calcutta), told me of a dresser in the Leper Asylum, as referred to in his report, who is still clean, although he has followed his present avocation over twelve years. But it must be remembered that in inquiries of this kind, one positive case outweighs a dozen negative ones. Thus within the last few days, Dr. Stewart, on making further inquiries into the history of Soomer dressers in the same asylum, has elicited the startling fact that two of them have really contracted the disease there. An analogous fact I have from Dr. Greiner, now in Bintefore. About four years ago, the Government placed him in charge of a small hospital for lepers, at Malany, in the eastern district of Java, that he might test the effects of hydropathic treatment on the inmates. Not only his chief dresser, who was of a clean family, contracted the disease there, and died of it, but he, in his turn, communicated it to a relative of his. It ought to be borne in mind that exceptional instances of immunity have been recorded from almost every contagious disease, not excepting small pox, the most virulent of all.

There is yet one feature in the natural history of the disease which ought to engage the closest attention of medical men. I mean the part played in it by the nervous system. That the peripheric, sensitive, or cutaneous nerves are deeply affected from the beginning, the anaesthesia which is hardly ever absent entirely in either of the two forms, clearly shows. Dr. Carter's most valuable anatomical researches have demonstrated a complete shrinking of the neurilemma, with disappearance of the nervous fluid in some of the nerves of the extremities. That the motor

nerves do not escape the influence of the disease, appears from the contraction of the fingers, which is often one of the first symptoms; and in the simply anæsthetic form, unaccompanied by any alteration of the skin or underlying tissues, it is mainly owing to paralysis of the extensor muscles. The nutrition of the extremities suffers next; the skin becomes harsh, sealy, and desquamates. The muscles of the hands and bones of the fingers begin to waste; the cellular tissue either shrinks or becomes thickened, causing adhesions between the skin and aponeuroses, thereby increasing the contraction. All this indicates a deep affection of the nerves, to which cause I also refer the ulcerations around the nails and in the creases of the joints of the fingers followed by the loss of the phalanges, when it occurs in the simply anæsthetic form, without being preceded by tubercular knobs or patches. It is absorptive ulceration from atrophy, from waste.

In the next place our attention is fixed by the fact that, from the beginning, symmetrical nerves are apt to be affected, either simultaneously or successively. Thus, for instance, the parts supplied by the ulnar nerve (generally the first one affected) become anæsthetic, and the fourth and fifth fingers contracted on one side, and soon after the ulnar nerve of the other side becomes similarly affected. The same thing I have observed in the peroneal nerves. The development of tubercles also follows, in a measure, the same law.

They will often appear successively in symmetrical parts of the face, or on the malar eminences, or over the eyebrow, their favourite *point d'attaque*. In the leper village at Canton, I saw one man who seemed to have lost sensation of pain, on being pricked over the entire surface of his body.

Taking all these facts together, we are led to ask ourselves—Do in reality the nervous centres remain intact? Is not one or the other of them, however inappreciably to the dissecting knife (Dr. Carter never found them altered), invaded by the disease in the first instance? Does not nutrition begin to suffer as soon as the sensibility? I am led to ask these questions, because in the leper asylum of Canton I have seen a considerable number of hemiplegic, besides amaurotic, and in some a mental condition bordering on idiocy.

One concluding word with regard to my experience on the subject of treatment. Disappointed, like every one else, as to final results, I have only found aggravation of the symptoms to follow systematic administration of mercury. A course of purgatives by cream of tartar and

jalap, in one recent case, would temporarily restore the lost sensibility of the forearm. Arsenic generally had some good effect, but a better one than from this remedy I have seen from the prolonged administration of nitrate of silver. The idea that a disease which has a tendency to deposit its products in the chorion or cutis, primarily, might most successfully be attacked by an alterative which has a preference for the same organ, is not very far-fetched. Besides, argenti nitras is a powerful tonic, and exercises an unmistakable influence on the nervous reflex-action, as in epilepsy. In one of the worst cases, a systematic administration of this remedy produced a complete arrest of the disease, which lasted more than one year; in many others amelioration followed its use. I commence by giving one-tenth of a grain three times daily, and gradually increase, until quarter and even half grain are reached, which occurs about the end of the third month.

If after four or six week's continued administration, no manifest improvement takes place, I generally abandon its use. From copious draughts of cold water, six to eight tumblersful daily, I have also seen some good effects.

In placing these lines at your disposal,

I have the pleasure of being, Dear Sir,

Yours most faithfully,

W. HILLEBRAND, M. D.

